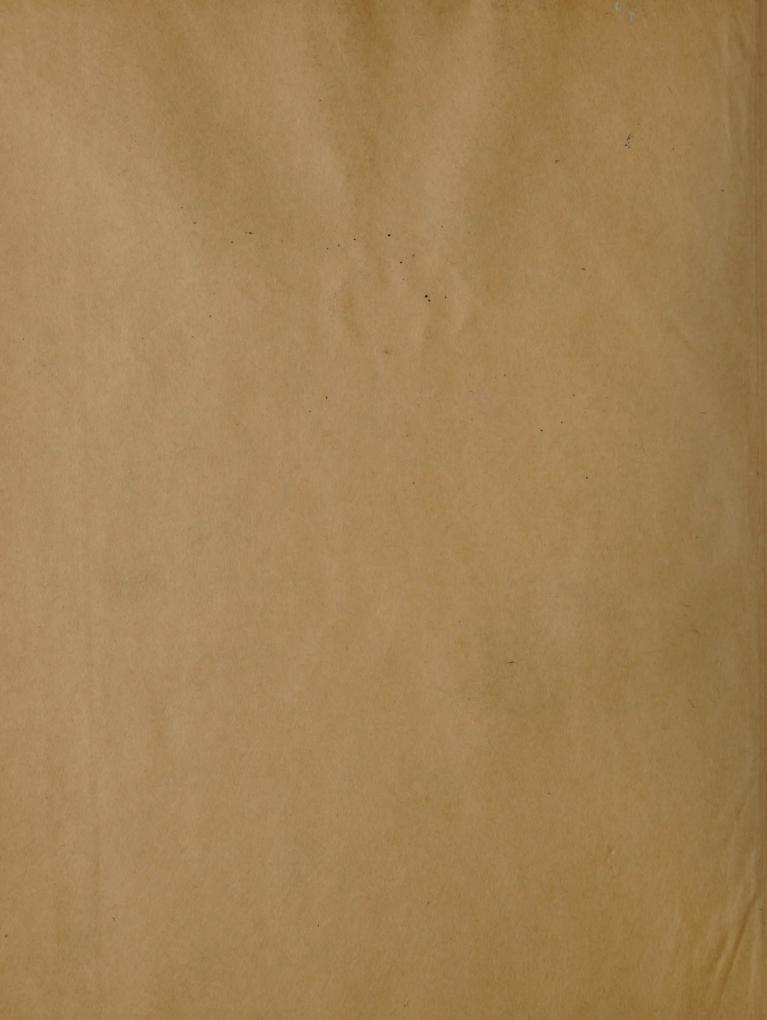




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HOW TO BUILD

A

ROWBOAT

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EDSON B. SCHOCK

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1798

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Introduction

THERE are countless forms of rowing craft. Not alone has each nation a particular and favorite form, but each locality, and even in some places different towns, have different kinds of boats. In most cases these craft are the result of local conditions, a development forced by the needs of those employing them or by the natural characteristics of the locality. Thus the boat used for fishing off shores where there are no harbors is necessarily a different craft from that used where harbors are easily accessible and secure. Boats employed for navigating still rivers are very different from those used in rough sea-swept bays and channels. The punts and wherries of the Thames River, the cobbles of the East English Coast, the sneak-boxes of Barnegat, and the skiffs of the St. Lawrence, are all local developments pecularily adapted to waters and purposes on which and for which they are used.

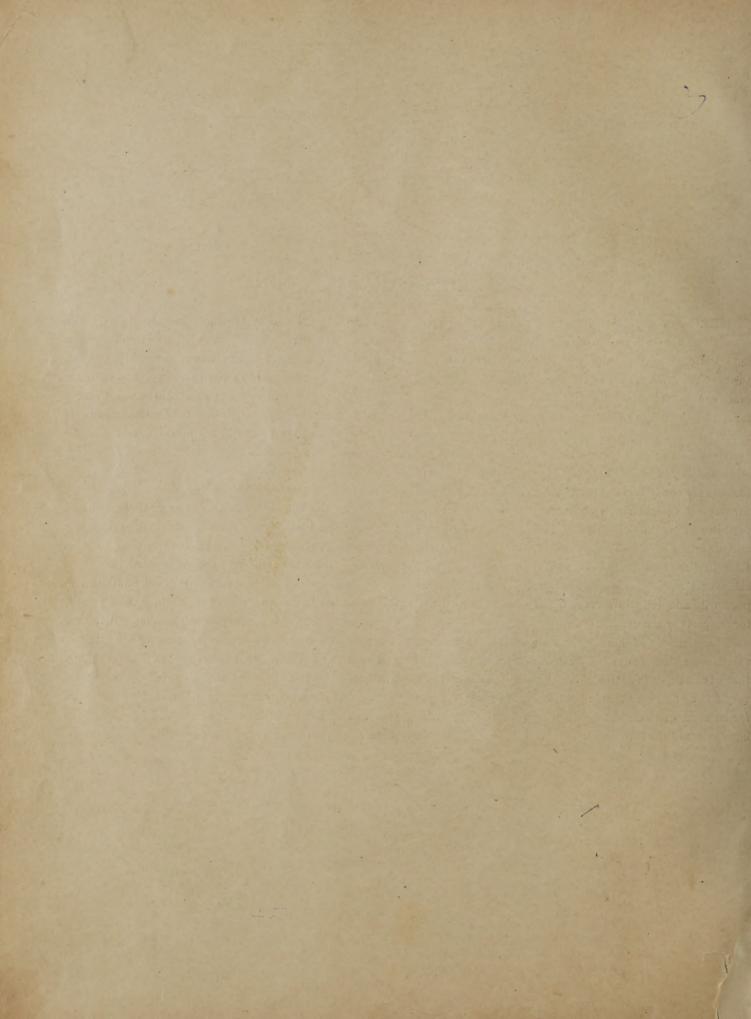
The methods of building rowing craft are almost as variable as their forms. The more common method is that of clinch, or lap-streak, as it is called. This makes a very strong and serviceable boat, but it is more difficult for an amateur to undertake than carvel building, so we have selected the latter way.

The craft yachtsmen are most interested in is the dingey or tender, a small boat used to attend upon a yacht to carry the crew ashore when the vessel is moored off land. Many boats have been designed and built for this purpose, which in one way or another seem to meet the requirements. The requirements of a tender are succinctly summoned up in the following doggerel:

Easy to row,
Easy to take aboard in a blow.

Add to this the ability to carry two or three men and you have the ideal boat. This boat has unfortunately never been produced, but we have come as near to it as possible in these here offered for your construction.

The principal object sought in the boats contained in this book was to design a craft that could be easily built, good looks being a secondary consideration. All three boats will be found to be smooth-rowing, good carriers, and of sufficient stability to be perfectly safe in any weather. For fastenings we advise copper rivets or brass screws, but if economy is sought galvanized nails can be used. The Editor of The Rudder will be glad to have pictures of your boat when built to publish



How to Build a Rowboat

10-FOOT DINGEY

IN settling upon the designs for these dingeys we have taken into consideration the general conditions under which they are used, and at the same time have made them just as simple as possible in the way of construction, so that any one at all familiar with the use of tools should have no difficulty whatever in producing a very fair boat.

The first dingey that we will consider is a flat-bottom one, 10 feet long, and this of course will be a very simple job.

The second will be a 12-foot, round-bottom, sailing and rowing dingey. This will be somewhat harder, but, with a little patience on the part of the builder, he should be able to accomplish the task with little difficulty.

The third and last one will be just a plain 14-foot rowing dingey.

There are three principal methods used by builders in planking small boats, and it would probably be well to discuss them at this time.

The first method is to build it of two thicknesses of material, laid one above the other, sometimes placing muslin, laid in paint, between, so as to get it perfectly tight. This makes a light and strong job, but not at all suited to us here. Another way is to plank with one thickness, placing the edges against each other as in ship work, and caulked. The other is the lapstreak or clinker.

This last method has many good features to recommend it, but is, I think, seldom used by amateurs except in canoes.

It is possible in this construction to secure a lighter boat with the same strength or a stronger boat of the same weight, as the laps of the planks add considerable of the strength and also allow of a reduction of about 1/8-nch in the thickness of the planks. It is also claimed that a linker-built boat will rise easier to a sea than a smooth-skin me, and the fact that all the surf boats along the New

Jersey coast are built in this manner seems to bear out this statement.

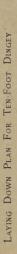
The Government also uses this construction in its surf boats for the Life Saving Service and also for the smaller whaleboats and dingers in the navy.

This principle of construction will be described by us for the 10-foot dingey, while we will use the smooth-skin in the other two. So much for the method of planking, and we will therefore leave it to the builder to decide which he will use.

Now, to get down to business. It is, of course, necessary in all boats to first lay them down to full size, so that you will be sure to have the boat perfectly fair. A good floor on which to lay down this dingey can be made of three or four pine boards, %-inch thick and wide enough to take the half breadth of the boat, and dressed on at least one side, while on the opposite side a few cleats should be fastened to keep them together. After this is done, a base line should be struck in, by using a chalk line, along one edge of the board, and afterward put in with pencil so as to prevent its being erased. From this line erect perpendiculars to represent every frame shown on the drawing, and one for the bow and one for the stern.

When this has been done it is time to get the table of offsets and lay off the sheer line, measuring up on each perpendicular the distance called for in the offsets. This will be found by looking along the top of the table until you come to the word "Rail" under "Heights" above Base Line," and by looking at the section numbers in the extreme left-hand column you will find the numbers of all the sections, and by following along the line on which the section number is, until you come to the column under "Rail," you will find the height you want for any particular frame or section.

After all the heights have been laid down, draw a line



through the spots by using a stiff batten, a little longer than the boat, holding it in place by small wire nails. Should the points be out a little, allow the batten to spring above or below them until you have a perfectly fair sheerline.

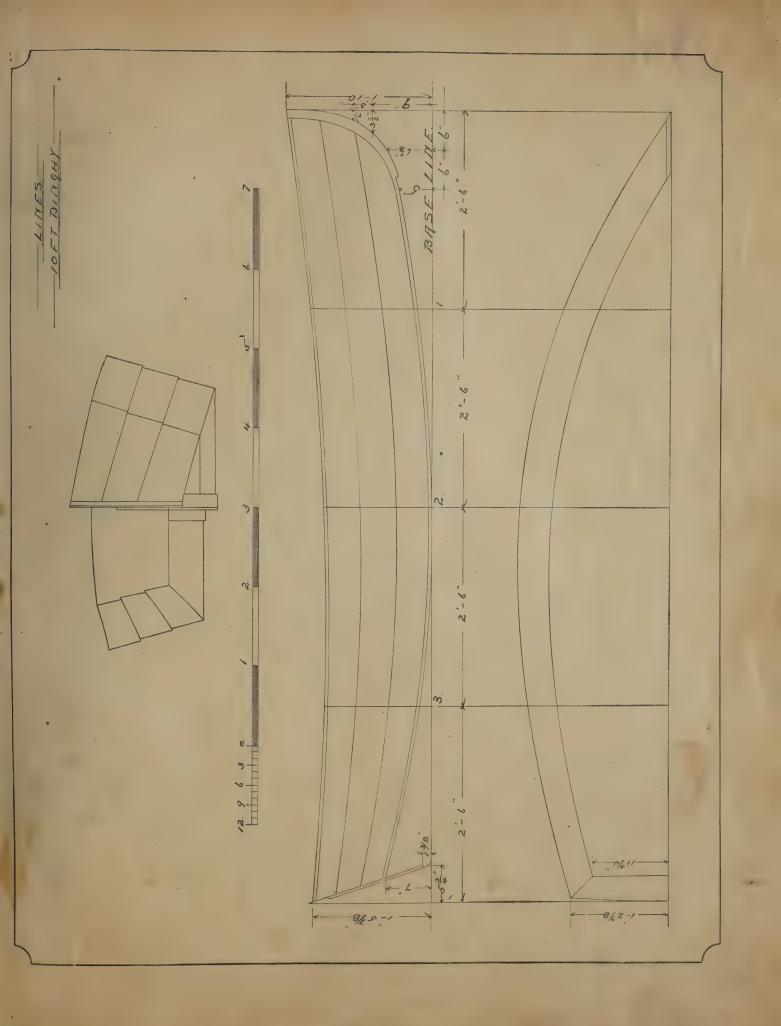
It is impossible to take measurements from a small scale drawing and enlarge it to full size and have all the points agree, so it will be necessary for you to do a little "fairing up" as you go along.

After you have drawn in the sheer proceed in the same manner for the keel line, and after you have the keel line drawn, vou can lay out the half-breadth of the rail, using the base line you already have as the center line of the boat. When you have the rail line drawn in, lay down the bottom line in the same manner, after which it will be necessary to lay down the body plan, which can be done over the sheer, from which we will make our moulds. To do this we measure up on the sections from the base line to the sheer and keel lines and out to the rail and bottom lines, transferring the points obtained to the body plan, and from the intersection of the sheer with the rail draw a straight line to the intersection of the keel with the bottom line and from that point straight in to the center line of the body plan and parallel with the base line.

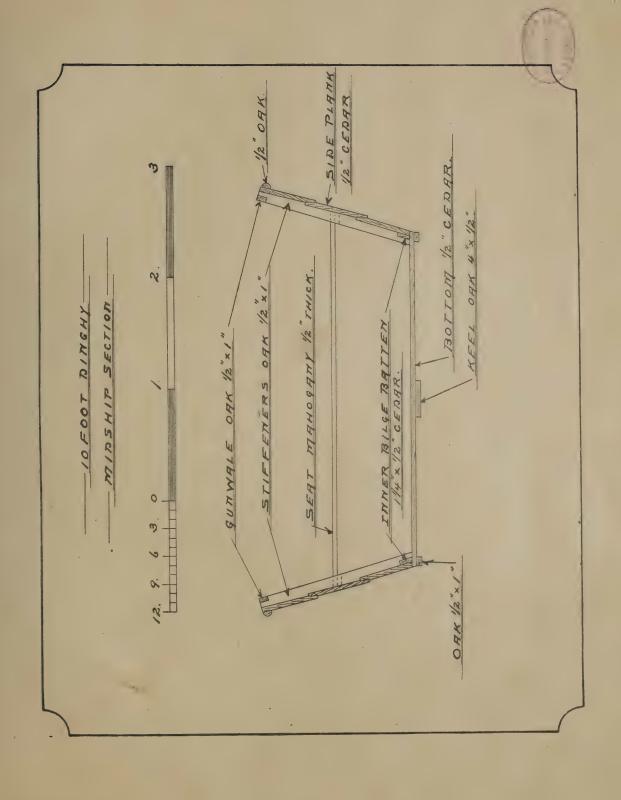
We will assume now that the boat is perfectly fair and that you are ready to make the moulds, but before that can be done it is necessary to draw on the body plan a line at the bottom and side ½-inch in from the one already drawn, as the line already drawn represents the outside of the planking, and we will plank the boat with ½-inch stuff.

The moulds can now be made of 3/4-inch or 7/8-inch pine or poplar, and you will require one mold for each station, and in order to transfer the line from the floor to the moulds take a handful of nails with flat, round heads, placing the heads along the line of the inside of the plank, then place the mould on the same and tap it with a hammer, thereby leaving an impression on the moulds, to which you can cur. After one side of the mould has been cut out and fitted to be floor, to see that it is all right, a depicate must be rade and the two carefully fitted together. From the same of the mould at the intersection of the side plank are sourced purposed to the will be explained later.

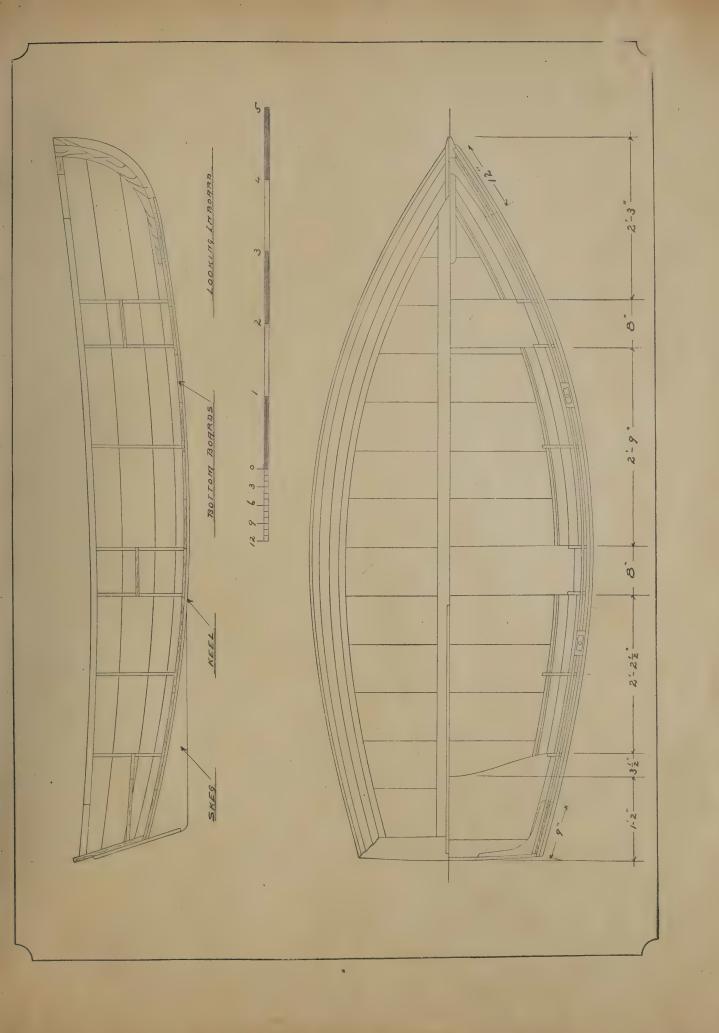
After the moulds are made you can get out the transom, and for this you will require a piece of 3/4-inch oak or mahogany. You can lift the shape of this by the











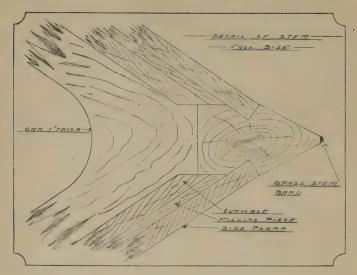


measurement given in the drawings. It is well to bevel the transom at once, and you can get the bevel by using a square that can be set at any angle and place it on the sheer plan where the bottom of the transom meets the keel, keeping one part of the square on the transom line, and move the other half until it is on the keel line, then secure it, and the angle you have will give you the bevel for the bottom of the transom. The bevel for the sides is taken in the same manner, but the transom has to be notched for the planks to fit into.

Before setting up the moulds it would be well to get out the stem, and for this you will require an oak or hackmatack knee two inches thick, and work it down to the shape shown on the construction drawing.

Now we can begin to set up the moulds, and special care must be taken to have them properly set up, or the boat will be lopsided. In a flat-bottom boat the best manner is to build it bottom up, so we will proceed to set up the moulds in this manner by supporting them at each end, or side, by wooden supports securely shored to prevent them from shifting their position, after which you can run one ribband on each side and two on the bottom. This will hold the frame securely in place while fitting the side planks.

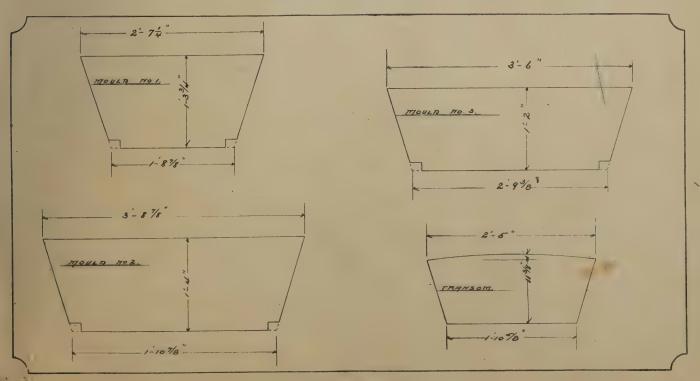
For the side planks we will require some white cedar boards, dressed on both sides to ½-inch thick, and long enough so that there will be no butts. In selecting the



planks be sure and get only those that are free from knots, sap, etc.

In order to get the width of the planks, divide each mould into three equal parts and from these points strike in a line ½ inch above and below each of the marks, using a ribband the full length of the boat. This will give you the line of the top and bottom of the laps formed by the middle plank, the top of the lowest plank and the bottom of the sheerstreak. (The top in all cases refers to the rail of the boat, no matter how it stands.)

The bottom of the top or sheerstreak will lap over the middle plank a distance of one inch and likewise the



DETAIL OF MOULDS

lower edge of the middle plank will lap over the upper 'edge of the lower one.

Now take one of the boards to be used for the lower plank, or if you prefer, a 1/4-inch piece of white pine, which we will call a staff, and place it on the side, holding it in place by clamps, or small wire nails driven into the molds a short distance so that they can be easily withdrawn, and from the inside of the boat make a series of marks on the plank, showing its upper and lower edge. When this is done remove the plank and with a stiff batten sweep in the edges through the marks just made, after which saw out the plank and finish it up with a plane. Care should be taken to have a snug fit at the rabbet of the stem. It will also be necessary to bevel the upper edge of the plank, on the outside to a thickness of 1/4-inch, carrying the bevel back to a diminishing line one inch from the edge of the plank. This forms the lap for the lower edge of the middle plank.

The other planks are fitted in the same manner, only the lower edge of the middle plank is beveled on the *inside* and its upper edge on the outside, while only the lower edge of the sheerstrake is beveled on the inside.

Where the side planks come into the rabbet of the stem it will be necessary to bevel the adjoining surface of each plank until about one-half of each has been cut away, beginning about 18 inches back from the stem. This is necessary in order to secure a smooth surface at the stem.

After all the planks are on it is time to start and secure the edges of the planks together, and for this we will need some 4-penny copper nails with washers. Care should be taken to see that the surfaces are together before riveting, as otherwise you will be apt to split the wood. In all cases holes should be bored slightly smaller than the nails to be used. Be careful to keep the heads of the nails the same distance from the edge of the plank, they will look bad if uneven.

After this has been done we will get out a perfectly clear piece of spruce or cedar, 1½-inches x ½-inch, the full length of the boat; this we will fit in the small square corners cut in the moulds. Secure this, which we will call the inner bilge batten, on the bottom of the lowest plank, so that the two edges will come flush. After this has been secured you are ready to bevel the lower edges of the side planks preparatory to putting on the bottom boards.

Get a straight edge out of I-inch white pine, long enough to extend across the bottom of the boat, and place it on the bottom so that the edge rests on each side plank.

You will notice that it rests on only one small edge of the side plank. Now take a draw knife and bevel both side planks until the straight edge rests evenly throughout, finishing it off with a plane.

We are now ready to put the bottom on the boat, which should be of the same material and thickness as the sides, and about 8 inches wide. The best plan is probably to start in the middle and work toward the ends. Be sure and get the edge of the plank at right angles to the center line of the boat, as otherwise the planks will be on crooked. After the plank has been cut, and before securing it, you can bevel same by placing it in position and marking off the bevel by using a short straight edge placed against the side plank and projecting beyond the bottom board.

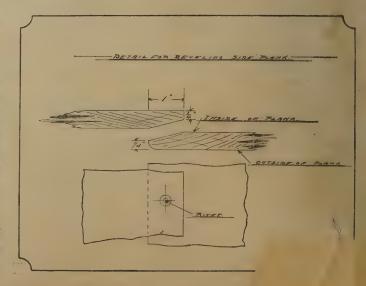
It would be better to leave one-sixteenth inch to be planed off when the bottom is all on and secured.

Now put on the keel, which should be of $\frac{1}{2}$ -inch x 4-inch oak with a slot $\frac{3}{4}$ -inch wide cut in the after end of the skeg to fit into. After this is secured, you can put the skeg on by fitting it in the slot and to the transom as shown.

The outer bilge batten can now be fitted, after which we are ready to turn the boat right side up.

We will now put in the stiffeners for the side planks, locating them as shown, and cut out for the laps of the side planks and inner bilge batten. These should be made to fit the side perfectly, as we will secure them to the side plank. At the top it will be necessary to notch them out for the gunwale, which will be of oak ½-inch x 1.

Put on the half-round fender of oak, as shown, securing it to the plank, but not through the stiffeners, as we will put a fastening through there and the half-round for the gunwale which can now be put in. At each after



corner of the transom and side plank fit an oak knee as shown and also a brest-hook at the bow.

The seats can now be put in, supporting them on 3/4-inch x r-inch white pine supports, fastened through the side planks. Should it be necessary to remove the moulds before the seats can be fitted, brace the sides apart by temporary braces, which can be removed after the seats are in place. It will also be necessary to cut out a small corner of the molds to allow the gunwale to go in.

The foundation for the rowlocks can now be put on and the sockets fitted.

The bottom of the boat is the only part that will need caulking, and that only slightly if the boards were properly fitted. After this is done you are ready to smooth the boat up preparatory to painting.

In the bottom of this type of dingey are fitted temporary slats to step on and keep the feet out of the water, should there be a little in the boat, and we will leave it to the builder to decide whether he wishes these or not.

TWELVE-FOOT SAILING DINGEY

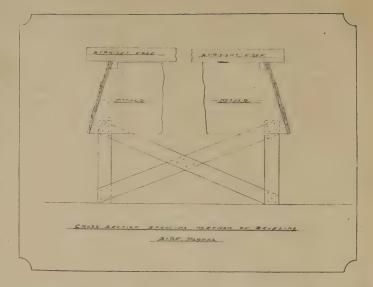
In building the 12-foot sailing dingey it is necessary to lay the boat down in somewhat the same manner as the previous one, and we will therefore assume that you have the "floor" made of sufficient size to lay the boat down and have the base line and perpendiculars already marked out.

We will start with the sheer and keel line and then with the half-breadth at the rail. After this is done lay down the diagonals. When this is completed we will be ready to start on the body plan, which can be laid down over the sheer.

First draw in the water lines, buttocks and diagonals, using the dimensions shown on the drawing of the lines. It is now a simple matter to lay off the points through which the sections must pass and to sweep them in with a small flexible batten.

The lines we now have represent the outside of the plank, and we will therefore take a compass set at ½-inch radius, the thickness of the plank, and make a series of small arcs, as shown, on the inside of the lines we already have and then run in another set of lines tangent to the arcs.

We are now ready to make the moulds, which can be solid or built up. In order to lift the sections from the floor take a lot of nails with flat round heads and lay their heads on the line representing the inside of the blank, and placing the mould on same tap it with a



hammer. The heads of the nails will leave an impression on the moulds. After one side of the mould has been cut out and fitted to the floor, to see that it is all right, a duplicate must be made and the two fitted carefully together.

When the moulds are completed, you can set them aside while you get out the keel, and for this you will require an oak plank I inch thick by 8 inches wide and IO feet 6 inches long. First strike in a center line and then the rabbet line on each side and the outside of the keel. The slot for the board should also be cut at this time.

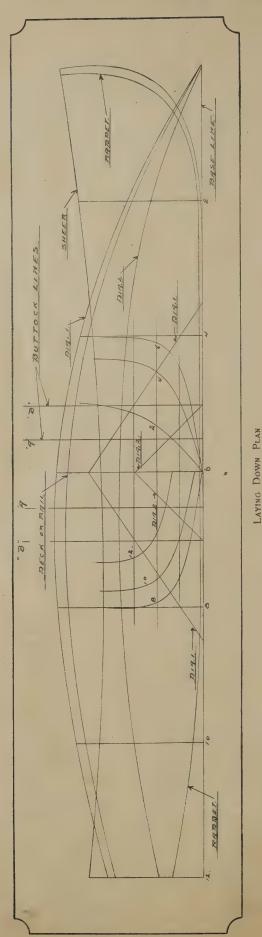
The stem can now be gotten out of an oak knee to the shape shown on the construction drawing. This will also form the step for the mast.

After the stem is finished you can get out the transom, and for this you will need a piece of 7/8-inch oak or mahogany, and we are now ready to set the moulds up, which can be done bottom up, as was the case in the 10-foot dingey.

When the moulds are set up, keel, stem and transom in place, together with knee connecting keel and transom, and secured to the floor so as to prevent their shifting, we are ready to fit the centerboard trunk.

For the centerboard trunk we will require two side pieces of oak, as shown, and two head pieces. The head pieces will be of oak and securely fitted to the keel, as shown. The sides of the trunk should be secured to the keel by long brass screws and riveted to the head pieces, after placing a piece of heavy muslin soaked in thick paint on the bottom of each and the sides of the head pieces. This, if properly done, will make a good watertight joint.

In the drawing of the lines you will notice two sizes of centerboard trunk, one for a dagger board and one for



the ordinary triangular type. We have adopted the dagger type, on account of the less space it occupies in the boat.

Where the boat is to be used exclusively for sailing the triangular board would undoubtedly prove the most satisfactory.

Along each side of the boat there should be about three ribbands running from stem to stern, secured to them and to the moulds. This will help stiffen the frame while building and also to fasten the frames to while framing.

We are now ready to start the framing, and for this we will require some straight-grained, tough white oak, t inch thick.

The frames will be spaced 9-inch centers and will be 5%-inch wide by t inch deep at the keel and 5%-inch at the head.

In order to get the frames to bend easily it will be necessary to steam them thoroughly, and for this you will need a steam box. This need not be longer than the longest frame, with a section about one foot square. Together with the box get an old iron pot that will hold water. The top of the pot should be covered over tight with a pipe leading from same to the steam box, through which the steam will pass. Now all that is necessary is to fill the pot with water and start a good fire under it. One end of the steam box will, of course, have to be left open in order to insert the frames, and this you can stuff full of old rags to keep the steam in.

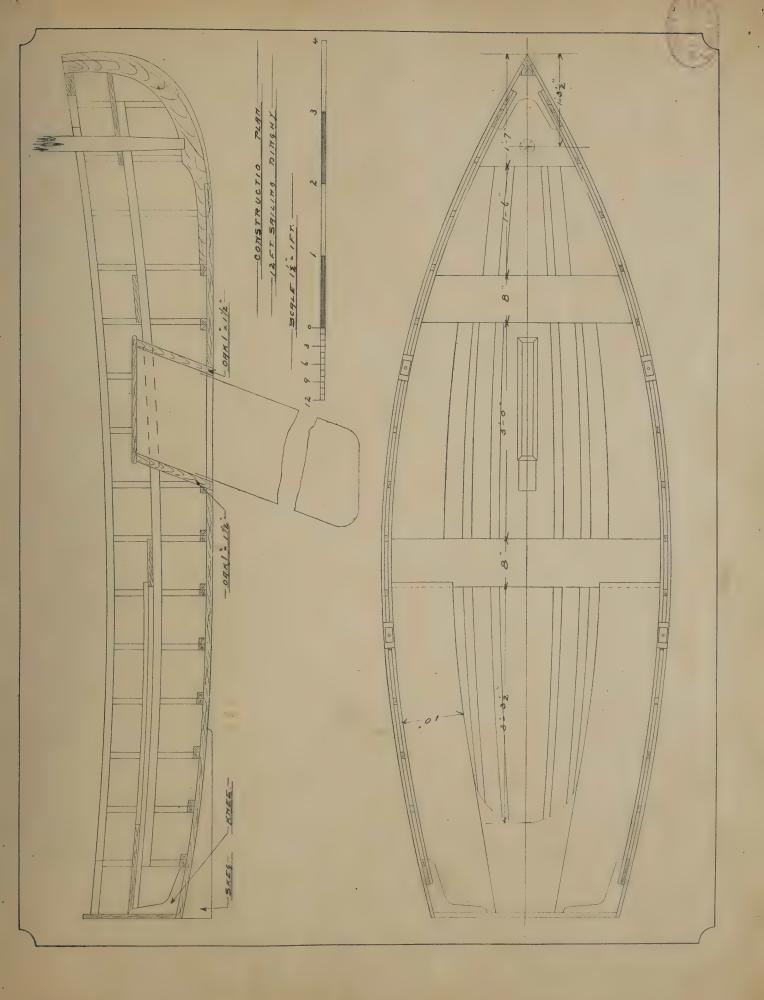
Remove one frame at a time and bend it to shape while hot, by fastening the heel of the same through the keel with a rivet, and bend from keel out until it touches the ribbands, to which it must be secured temporarily, after which the floors can be put in and secured to the keel and frames.

We are now ready to tackle the job of planking.

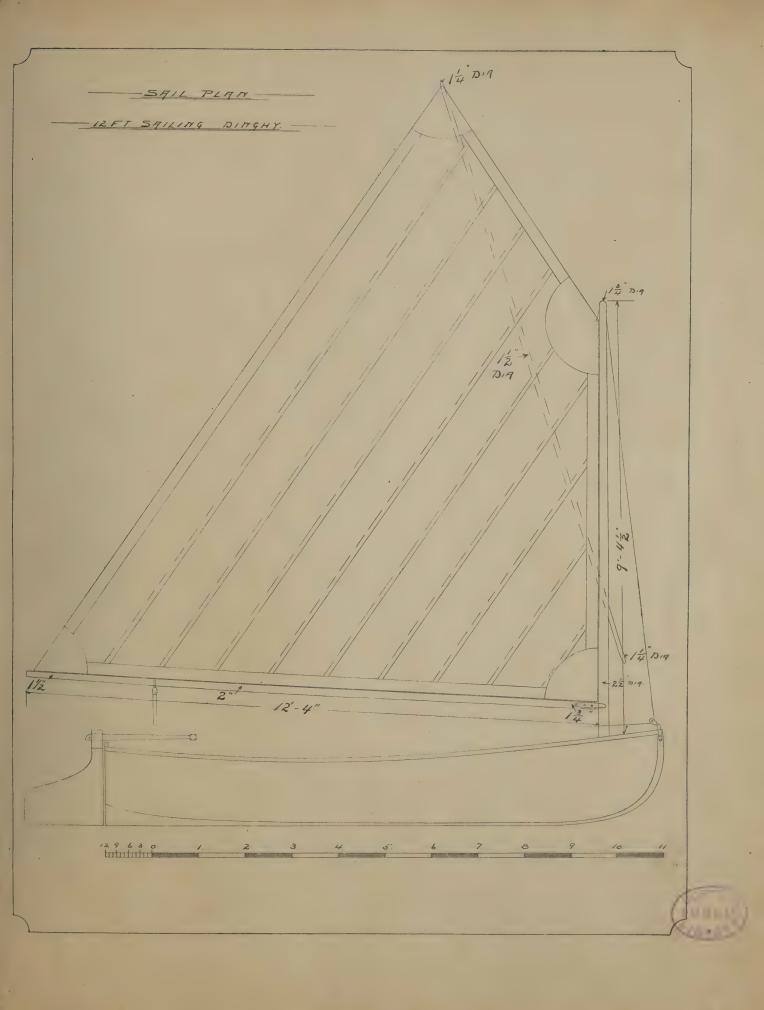
The planking of a boat is no more difficult than any other part in its construction, and by exercising plenty of care one should have no difficulty in this respect.

The material for the plank should be of $\frac{5}{8}$ cedar, and special care should be taken in selecting same to have it clear and free from knots, sap, etc., and the boards should all be long enough so that there will be no joint or butts.

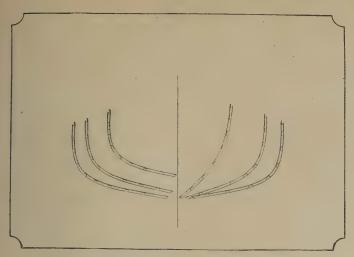
We are now ready to get out the plank next to the keel, or in other words, the garboard, and will take what is called a spiling. First get a piece of pine or cedar about 12 feet long, 4 or 5 inches wide and ¼-inch thick, so it will bend easily, and after cutting it,











SHOWING BODY PLAN TO INSIDE OF PLANKING

so as to roughly fit the rabbet of the stem, tack it to the moulds, or hold it in place with clamps. Now with a compass set at any radius and with one point on the inner edge of the rabbet, strike in an arc on the staff at every mould, beginning at the stern and working toward the bow. For a distance of about two feet from the bow the marks should be closer so as to get a close fit. After this is done and before removing the staff mark the position of two or three moulds on it so as to show where it goes. Now remove the staff and place it on one of the planks out of which we will cut the garboard.

Now with the compass set at the same radius as before we strike in new arcs on the plank by placing the point of the compass on each end of the arcs already drawn on the staff. Remove the staff and with a long stiff batten strike in a line through the intersection of the two arcs, which, of course, will be the point from which the first arc was drawn.

If you have been careful in taking the spiling, the plank should fit perfectly in the rabbet.

The upper edge of the garboard is laid out by deciding on the width the plank should be at several moulds and marking the line out by using a batten as before. It is customary to allow the garboard to run up pretty well at the stem.

After the plank has been cut out and the edges faired up with a plane, we will mark out a duplicate of it for the other side.

In putting on a plank always fasten it at the stem and work out toward the stern, being careful to wedge it tightly against the keel or plank that is already on, so as to be sure of a good joint or seam, which should be tight on the inside and open not over one-sixteenth of an inch on the outside for caulking. At the turn of the bilge it may be necessary to hollow the plank slightly on the inside so as to secure a perfect fit round the frame.

After the garboards are in place, it would be well to get out the sheerstrake, which can be of oak or mahogany. The width of this plank will have to be decided in the same manner as the garboard and care should be taken to have the sheer perfectly fair, as otherwise, the whole appearance of the boat will be spoiled.

When the sheerstrake is on, it would be well to lay out the widths of the remaining planks on the moulds, making those at the turn of the bilge somewhat narrower than those on the bottom or side, and also the widths of the stem and stern, which should be made uniform.

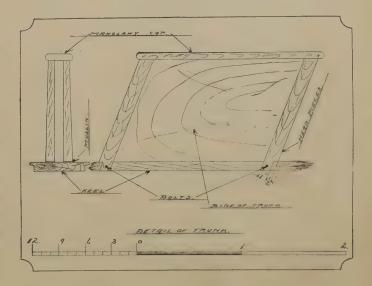
The last strake to go on is called the shutter, and should fit snug enough to require driving into place.

In planking, do not allow one side to get ahead of the other, but put first a plank on one side and the corresponding plank on the other.

When the planking is finished she should be planed over roughly, the final smoothing up being done just before painting.

The skeg can now be fitted and secured to the keel and transom, after which the boat can be turned over and the moulds removed, but before removing moulds brace the sides apart with temporary braces while you put in the risings, and for this we will require an oak strip 1½ x 5%-inch and about 11 feet long. When this is in the thwarts can be fitted; these can be of ash or mahogany as desired.

We will now put the half-round fender of oak on and secure it to the sheerstrake by clamps, while we get out the gunwale, and after the gunwale is in place



secure it through the frames, planksheer and half-round fender.

The knees can now be put in at the stern and the bresthook at the bow, after which the floor boards can be put in and secured to the frames with No. 6 brass screws.

We now come to the foundation for the rowlocks, which can be put on and the sockets fitted.

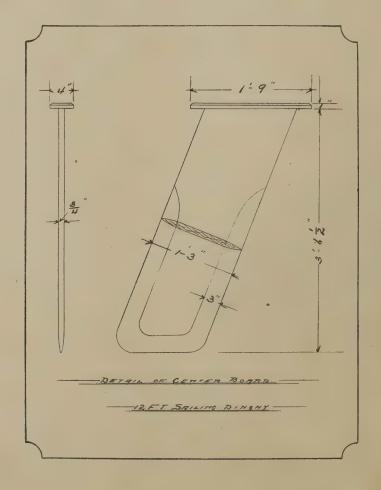
We are now ready for the final smoothing up and painting, and while the paint is drying we can turn our attention to the centerboard, spars and rudder.

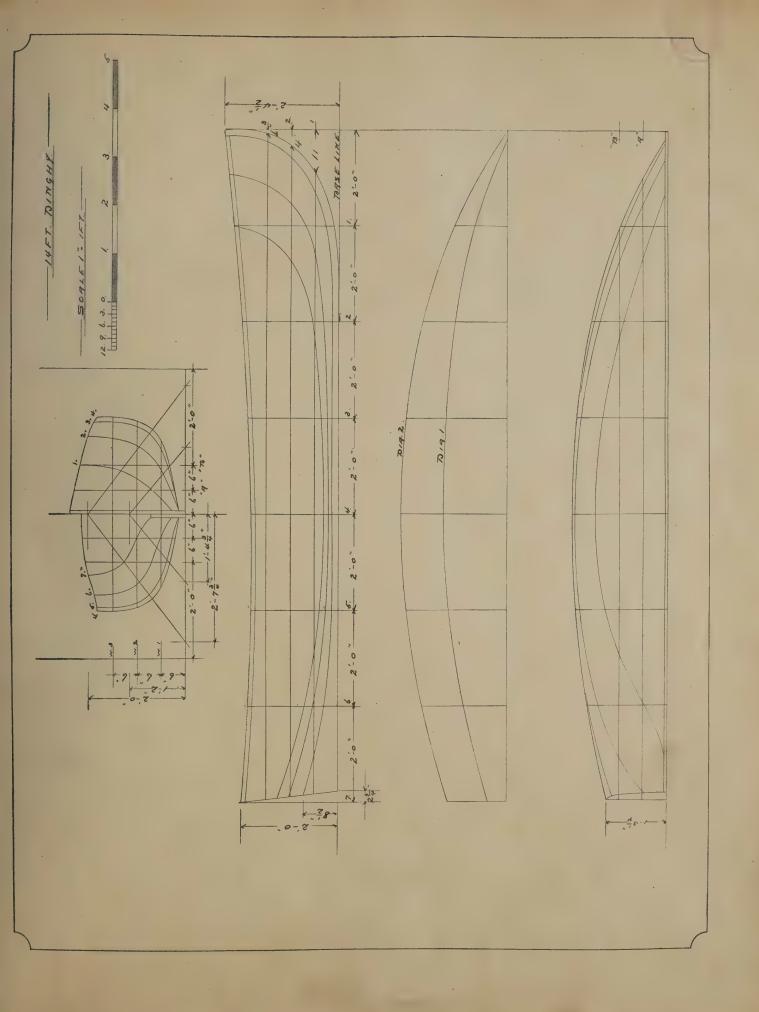
The centerboard should be of oak, as shown, and a small cap should be made to fit over the trunk when not in use. The spars should be of spruce, with sizes as shown, the mast having a sheave in the upper end, and the halyard passing to a block on the stem and belaving on a cleat on the trunk.

FOURTEEN-FOOT DINGEY

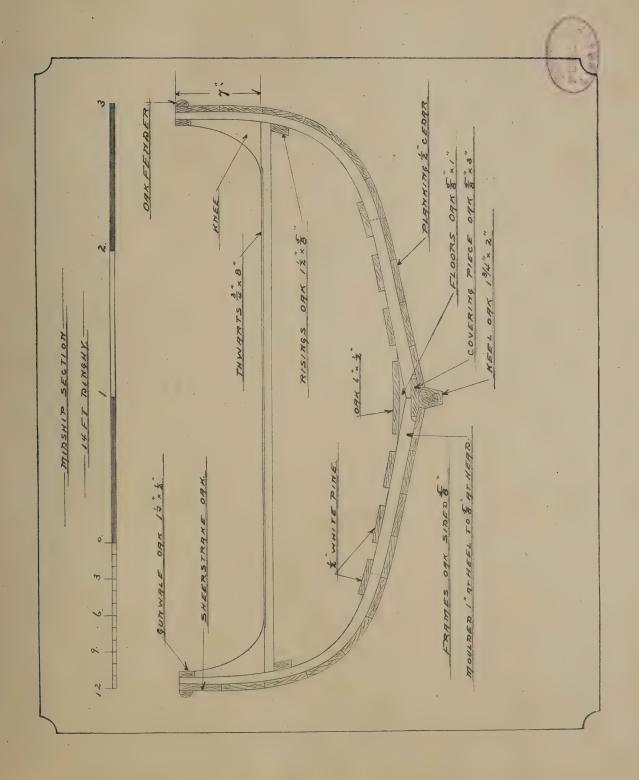
We will now take up the subject of the 14-foot dingey and you will notice that the only difference lies in the keel. This, of course, you can get out according to the drawings and set it up from the instructions given for the sailing dingey.

There is nothing I can say to assist you in this boat that has not already been said, and I will therefore leave it to you to build alone, and all that we ask is that you send us photo of your boat after she is completed.











CONSTRUCTION PLAN - IMENT THEMY 0 DEADWOOD



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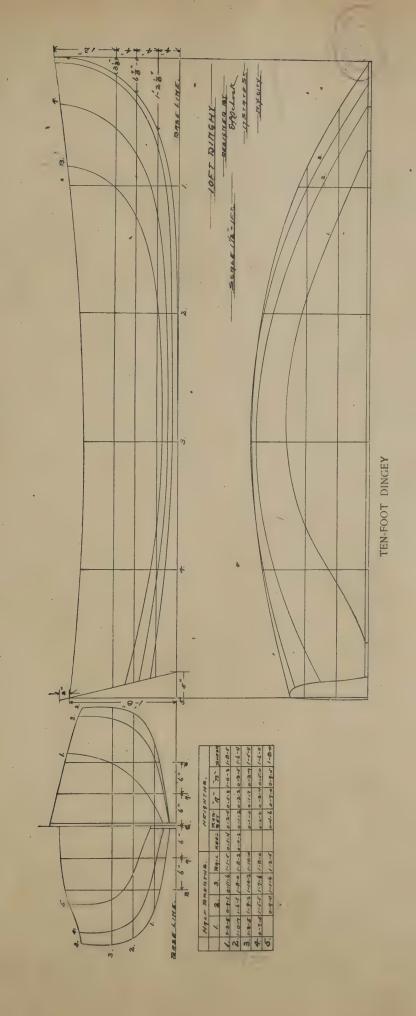
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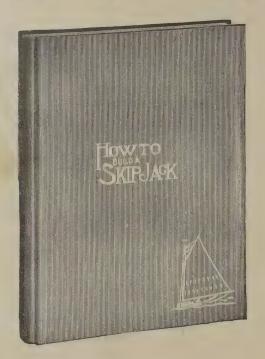
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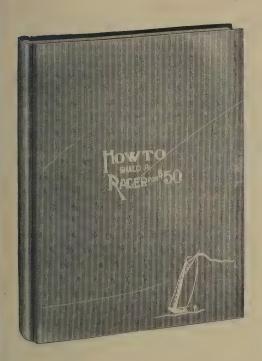


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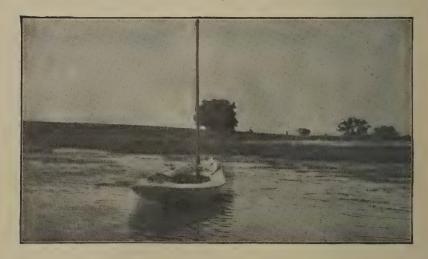
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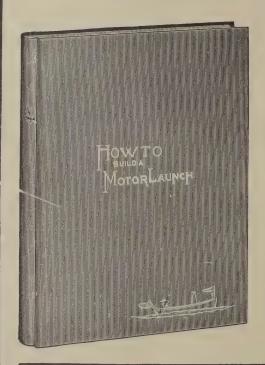
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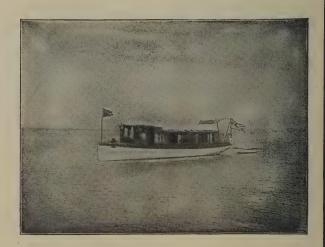


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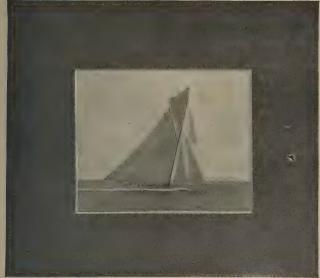
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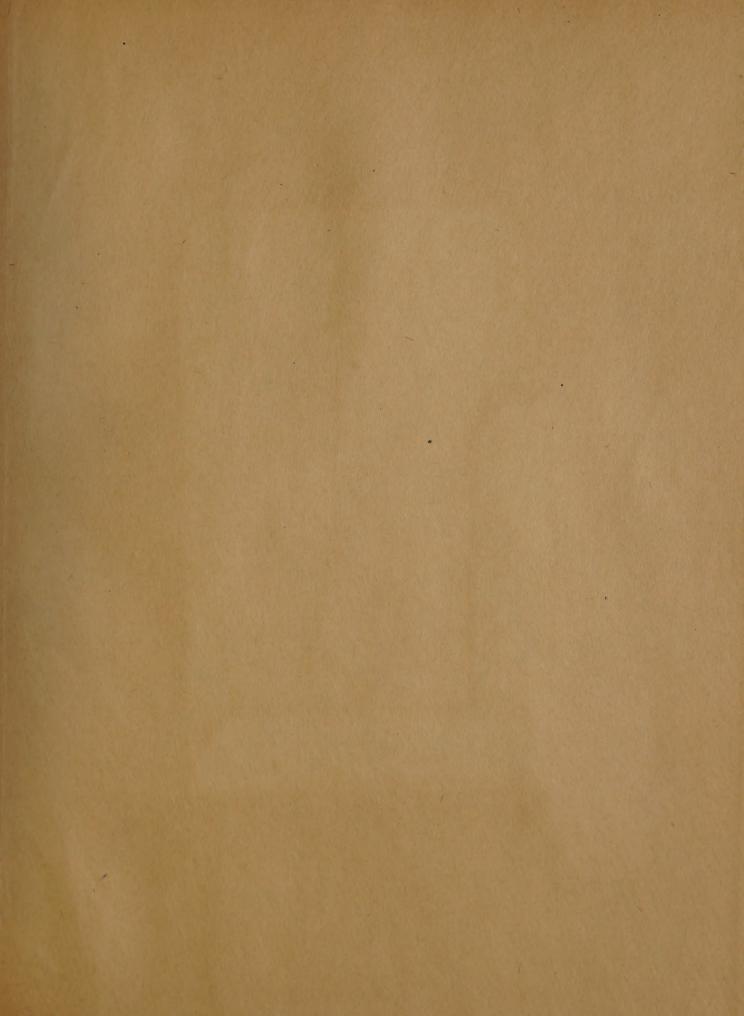












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